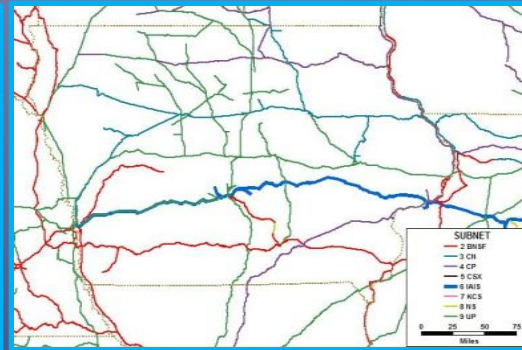
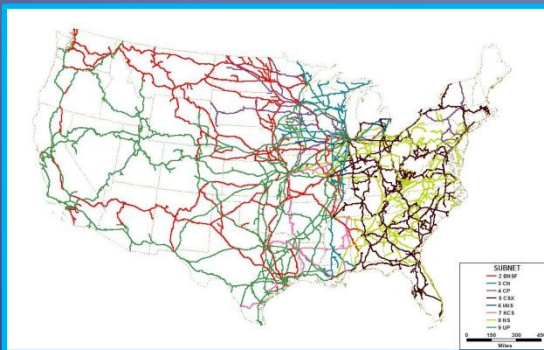


Iowa's Freight Advisory Council Meeting

September 11, 2015

IOWA STATEWIDE RAIL, FREIGHT & COMMODITY ANALYSIS MODEL

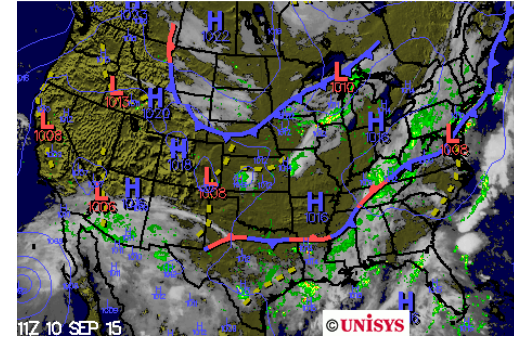


Outline

- Why rail freight commodity models matter
- Brief Iowa Statewide Model Development History
- Freight rail data sources and preparation
- Rail freight model methodology
- Application to statewide planning efforts
- Findings and lessons learned

Iowa Statewide Model History

- What is a travel demand model?
 - Similarity to weather forecasting models
 - Uses data and special software to forecast travel
- Metropolitan Areas rely on models to analyze travel and make programming decisions
- In 2006 Iowa DOT embarked to develop a statewide model
 - Ability to forecast cars and trucks
- In 2012 the model was expanded for rail freight/passenger travel and commodity movement analysis



Why Rail Freight Models Matter

Fact #1: Freight Traffic is Growing

US Freight Rail Traffic - Ton-Miles (millions)

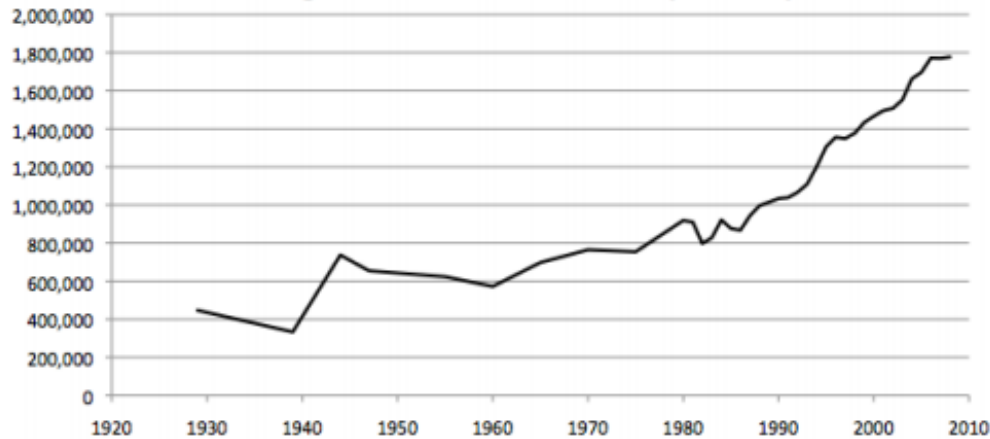
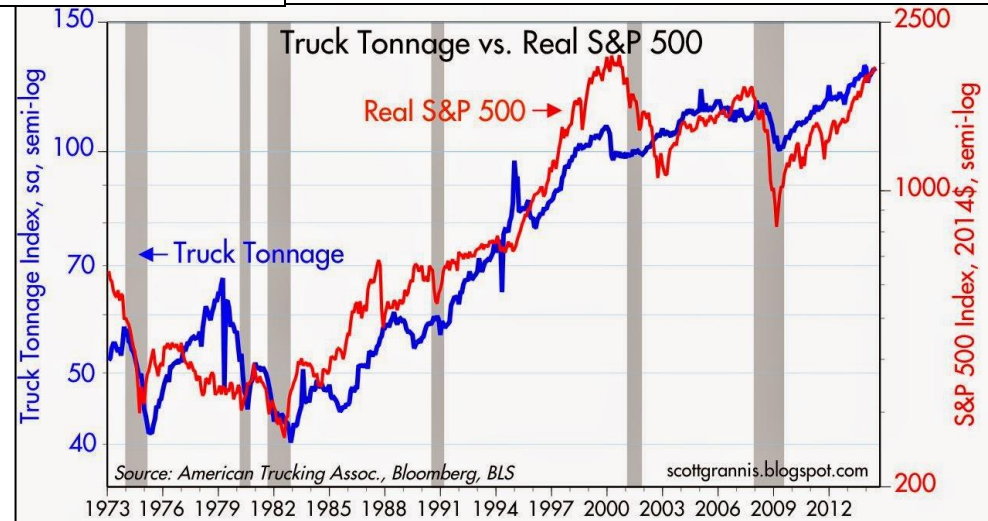


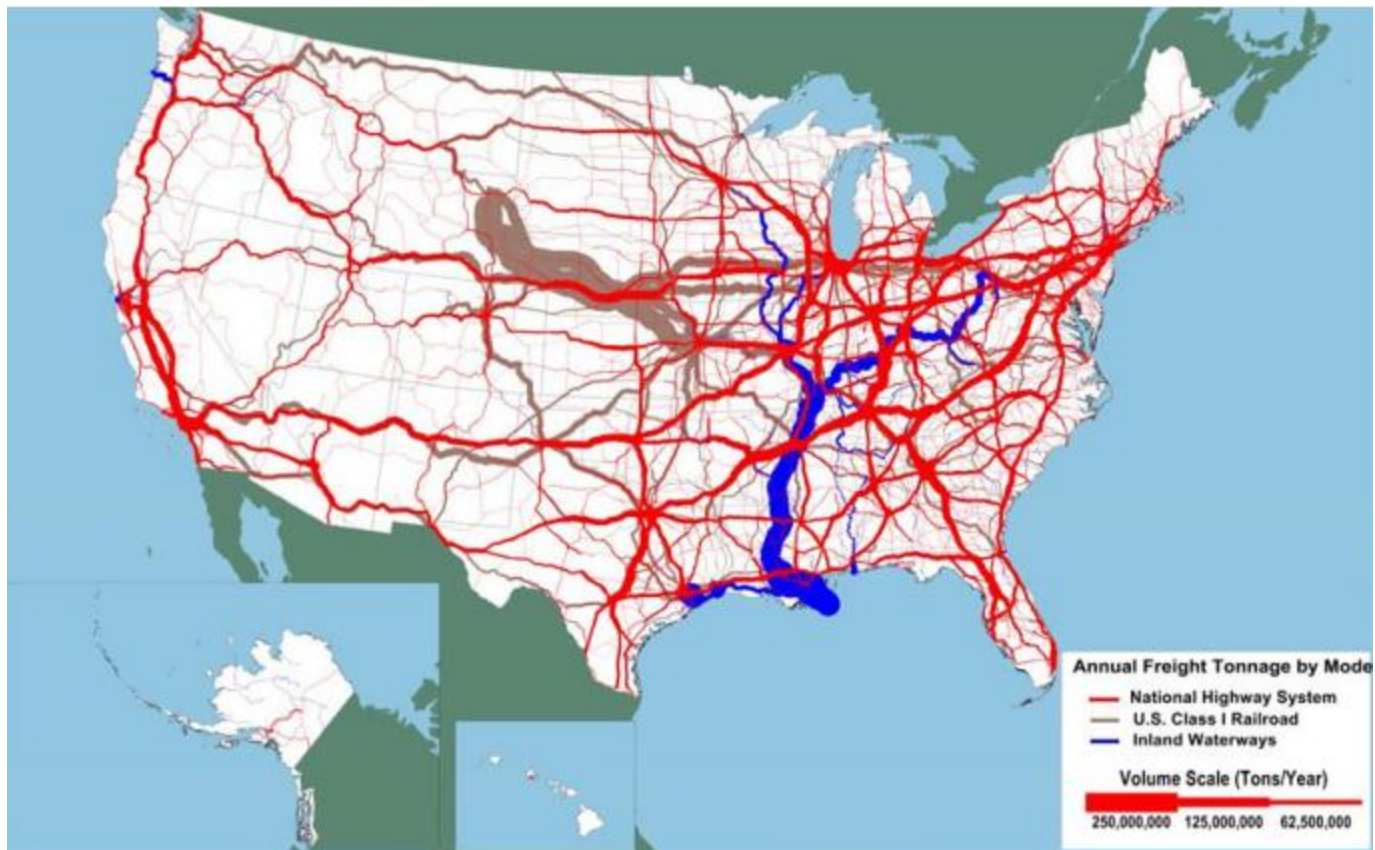
Figure 3: US Freight Rail Traffic in Ton-Miles, 1929- 2009



Why Rail Freight Models Matter

Fact #2: Scientific Tools are Needed

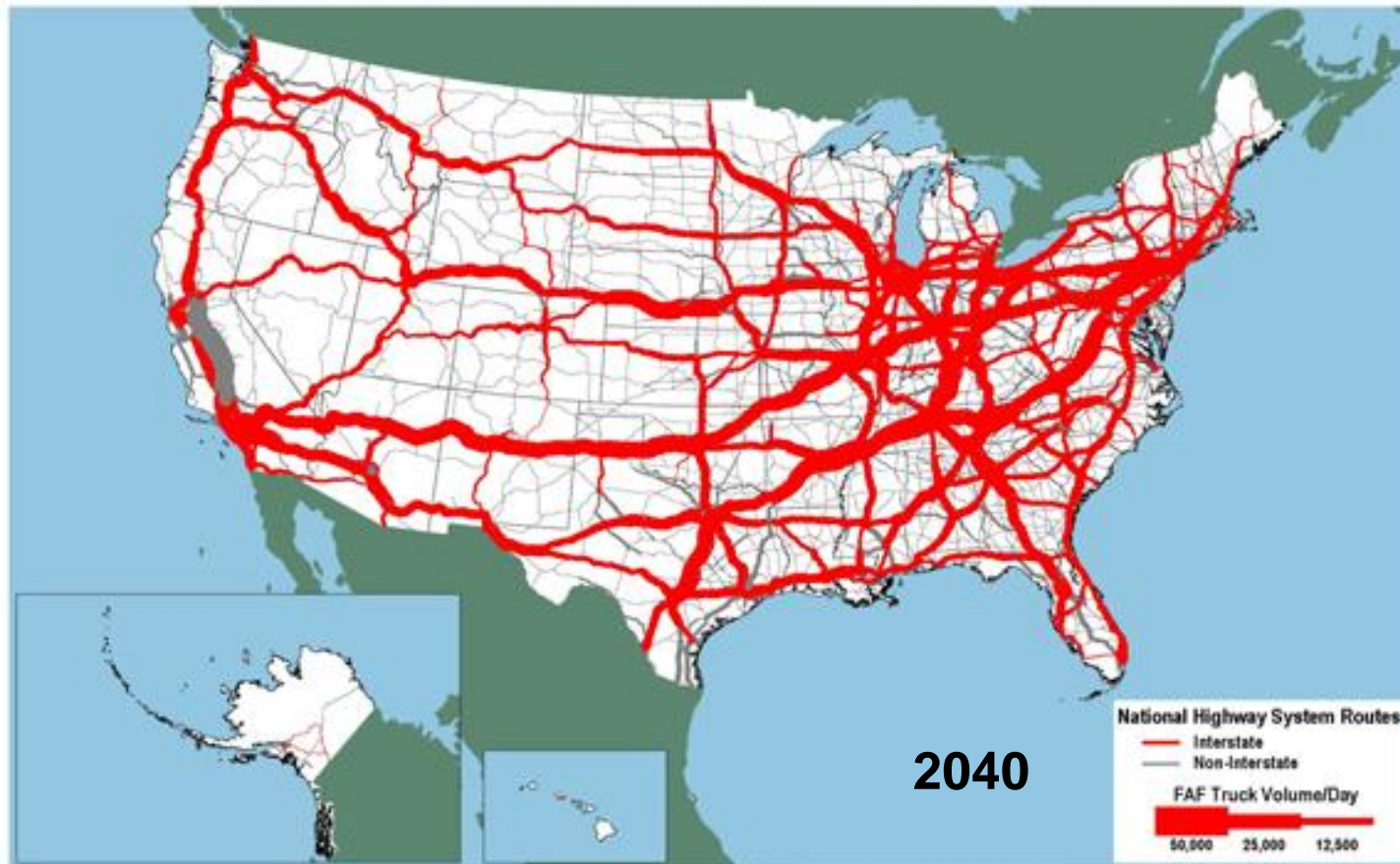
Freight Tonnage on Highways,
Railroads, and Inland Waterways: 2007



Why Rail Freight Models Matter

Fact #2: Scientific Tools are Needed

Exhibit 1-25 Average Daily Long-Haul Freight Truck Traffic on the National Highway System, 2040



Note: Long-haul trucks typically serve locations at least 50 miles apart, excluding trucks that are used in movements by multiple modes and mail.

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, *Freight Analysis Framework, Version 3.1, 2010.*

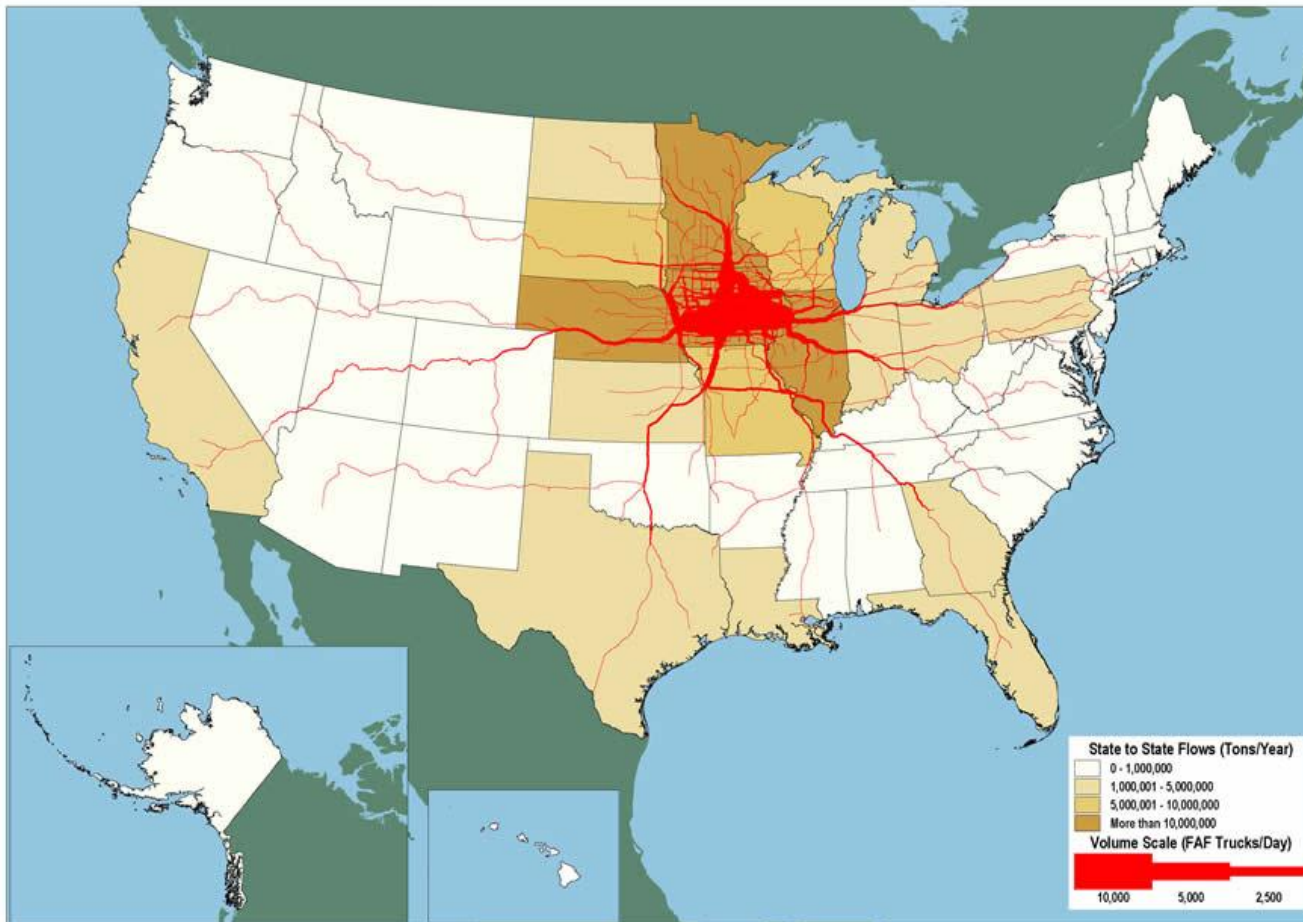
Why Rail Freight Models Matter

Fact #3: Federal focus is shifting

- MAP-21 Moving Ahead for Progress in the 21st Century
- Funded over \$105 billion for fiscal year 2013 and 2014
- Freight is a new focus in MAP-21
 - Stresses leadership in freight issues
 - National Freight Network established
 - Freight included in performance-based targets for states and MPOs
 - Freight strategic plans encouraged

Iowa Truck Movement

Major Flows by Truck To, From, and Within Iowa: 2007



Note: Major flows include domestic and international freight moving by truck on highway segments with more than twenty five FAF trucks per day and between places typically more than fifty miles apart.

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.1.2, 2011.

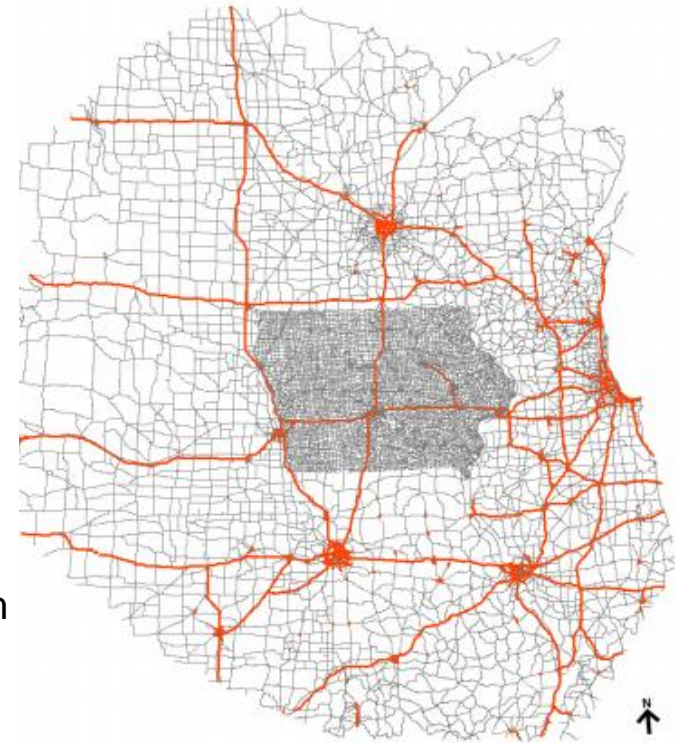
Project Impetus

- Integrating freight commodity flows into the Iowa Statewide Travel Analysis Model (iTRAM)
- First generation model for national rail freight commodity flows assignment
- Leverage Federal Railroad Administration (FRA) interest and funding – provide a blueprint for other states/regions to follow
- Freight Toolbox
 - iTRAM
 - Interstate Condition Evaluation Tool
 - Freight Network Optimization Tool



Iowa Statewide Travel Demand Model Expansion: What will it be able to do?

- Ability to forecast:
 - Automobile traffic
 - Large and medium-sized trucks
 - Freight traveling by rail
 - Passengers traveling by rail
 - Commodity movements independent of mode
- Analytical uses:
 - Traffic forecasting
 - Statewide and regional corridor analysis
 - Estimating inter-regional and multi-modal trips
 - Assessing policy impacts to the transportation system
 - Support long-range plan development
 - Identify potential areas of traffic congestion
 - Test impacts of land use changes on the transportation system
 - Test route diversion due to system closures related to flooding, other natural disaster, terrorism, etc.



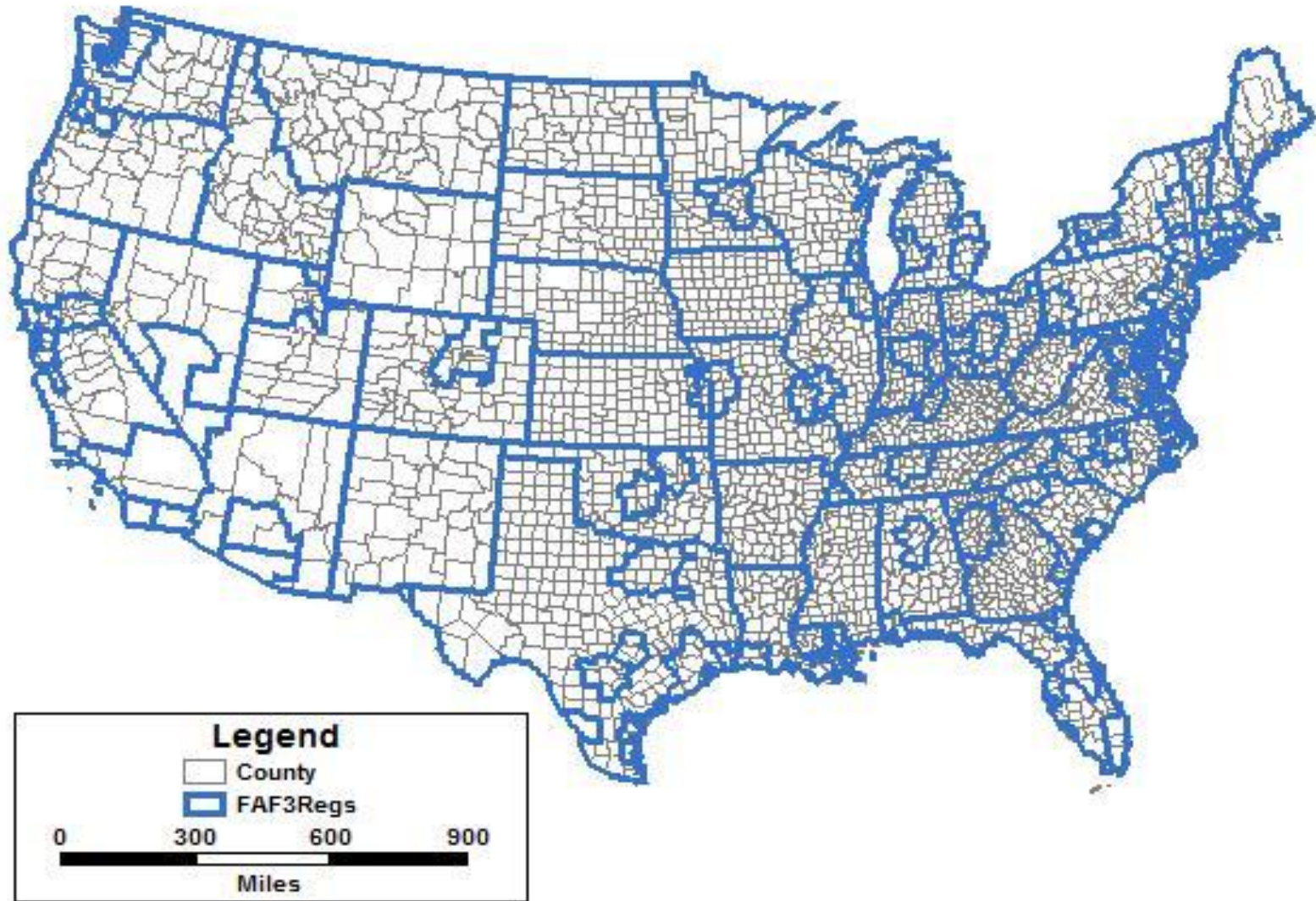
Freight Rail Data Sources

Summary of Inputs

- FHWA's Freight Analysis Framework (FAF3.4) data. Developed county to county flows.
- 2010 Census County Business Patterns
- 2010 Bureau of Economic Analysis employment
- Private long-term county employment forecasts for 2040
- Commodity Classification - Standard Classification of Transported Goods (SCTG)- 43 categories
- Iowa DOT Rail Network
- Oak Ridge National Laboratory's rail network

Freight Rail Data Sources

Freight Analysis Framework



Freight Analysis Framework (FAF)

- The (FAF) integrates data from a variety of sources to create a comprehensive picture of freight movement among states and major metropolitan areas by all modes of transportation.
- Based on 2007 Commodity Flow Survey
- Estimates:
 - Value
 - Tonnage
 - Domestic ton-miles by region of origin and destination
 - Commodity Type
 - Mode of Travel
 - Forecasts to year 2040

Freight Rail Data Sources

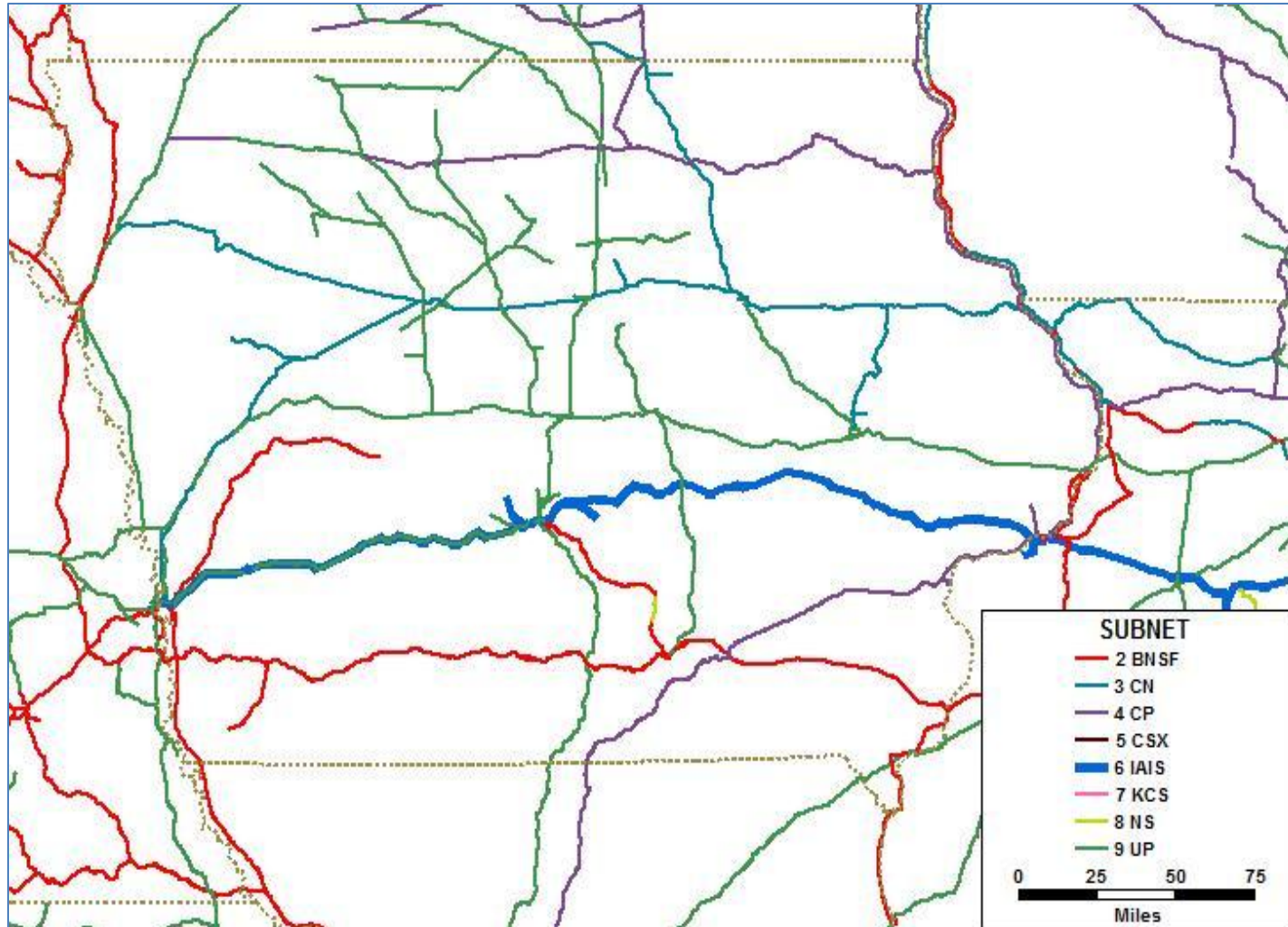
Oak Ridge Rail Network (Class I Railroads)



Some Class II railroads such as Montana Rail Link and Florida East Coast are colored as parts of the BNSF and NS respectively; they are in fact independent railroads, and are shown under the color of the Class I railroad segments they typically use.

Freight Rail Data Sources

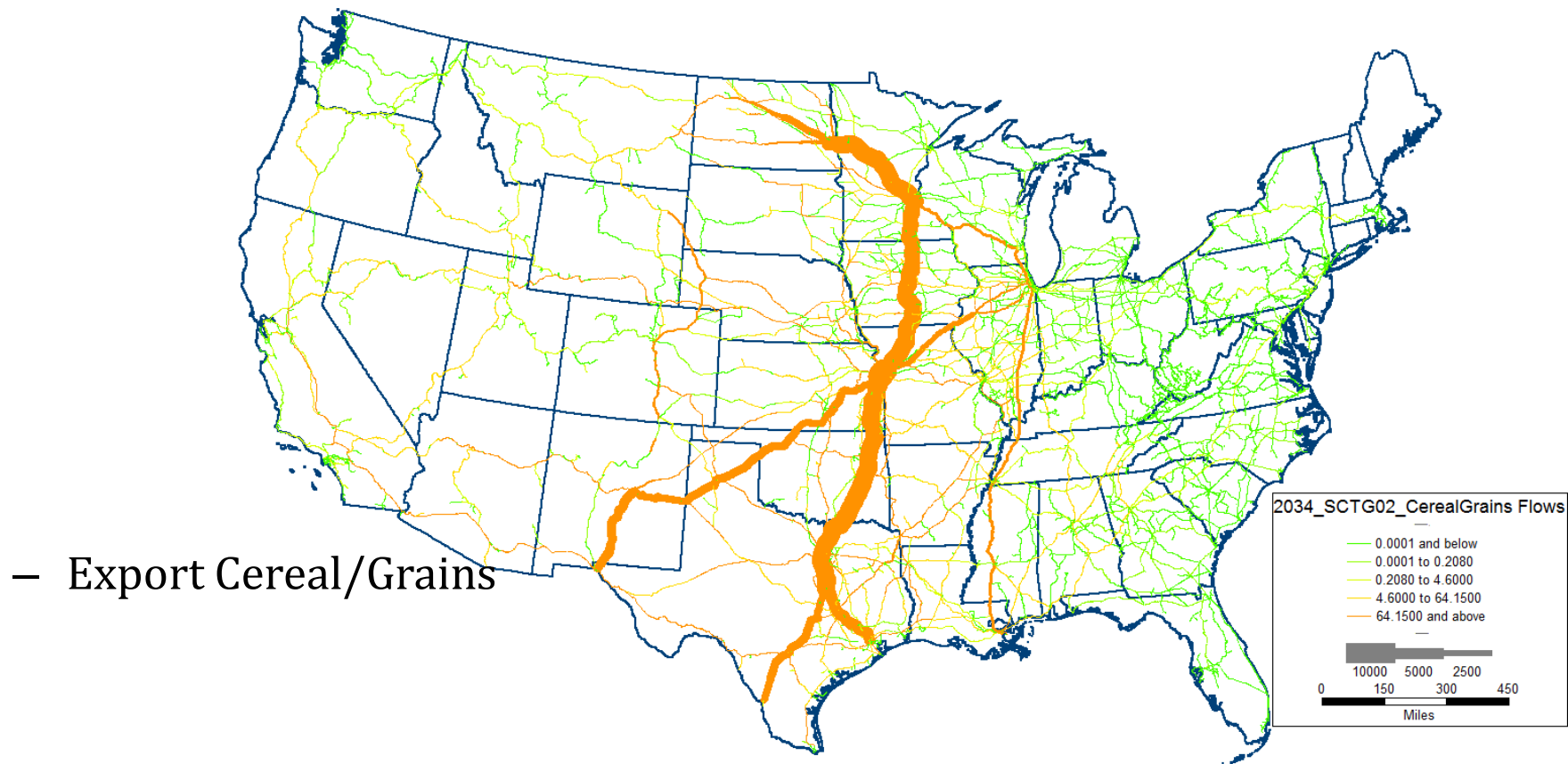
Class I Railroads in Iowa



Applications to Statewide Planning

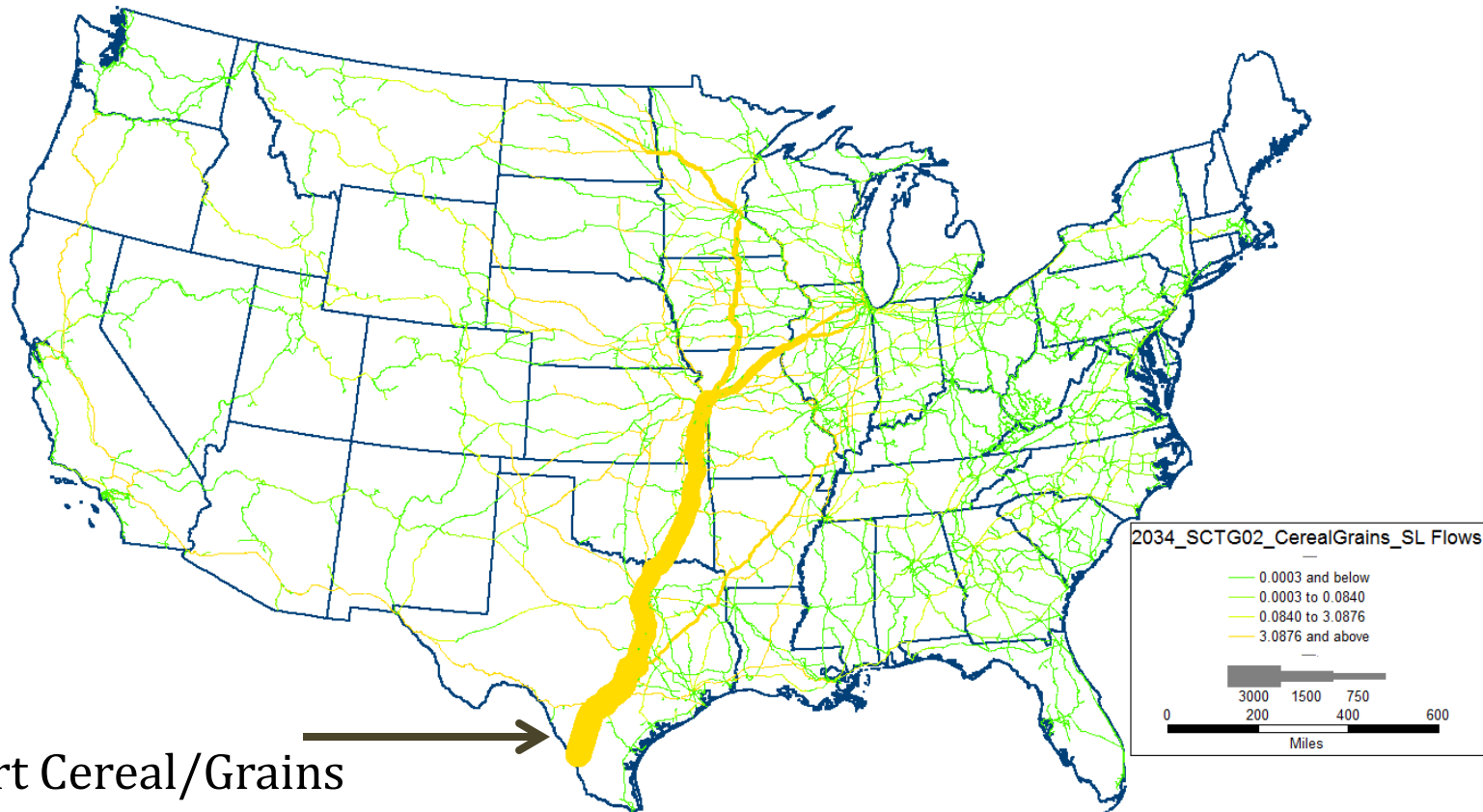
- National/Iowa Commodity Flow Analysis
 - Background (U.S. Through Rail shipments that affect Iowa)
 - Future year expected use of Iowa
- “What-if Rail Scenarios”
 - Diversion of rail traffic when track segments are removed from service
 - Adding tracks to an existing line
 - Upgrading track speeds or signals
 - Changes in ownership or track usage permissions
 - New rail line or track segment addition to the Class I rail system
 - Interline changes, adding or removing the ability to transfer
- Tools
 - Graphical User Interface
 - Interpolated Commodity for each year 2010 to 2040
 - Select Link

Year 2034 Cereal/Grains by Rail



Year 2034 Cereal/Grains by Rail Analysis

- Q: For a Specific Link where are the Cereal/Grains Coming from?



- Export Cereal/Grains
- Specific link analysis

Removal of Rail Bridge

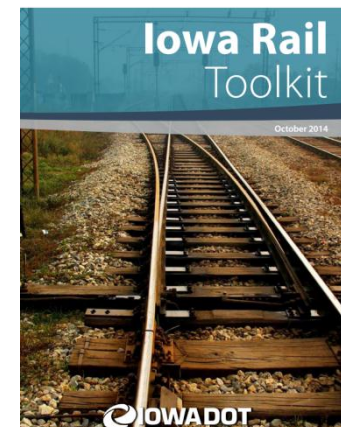
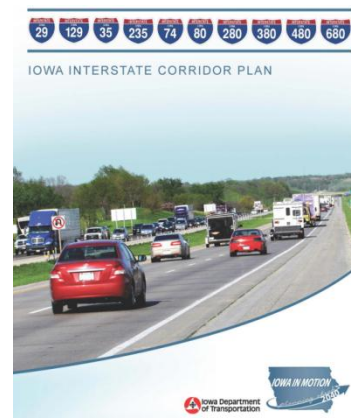


Current Status

- First of its kind statewide model
- Final project is now complete
- Staff has been evaluating the deliverables from the consultant
- We are still asking the consultant questions
- Rail commodity flow model calibration and validation is challenging
- There is a need for additional use and testing of the rail commodity model

Suite of Analytical Tools

- iTRAM (Iowa Travel Analysis Model)
- Freight Network Optimization
 - Supply Chain Optimization Model
- Infrastructure Condition Evaluation (ICE)
- Iowa Rail Toolkit





Questions?

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